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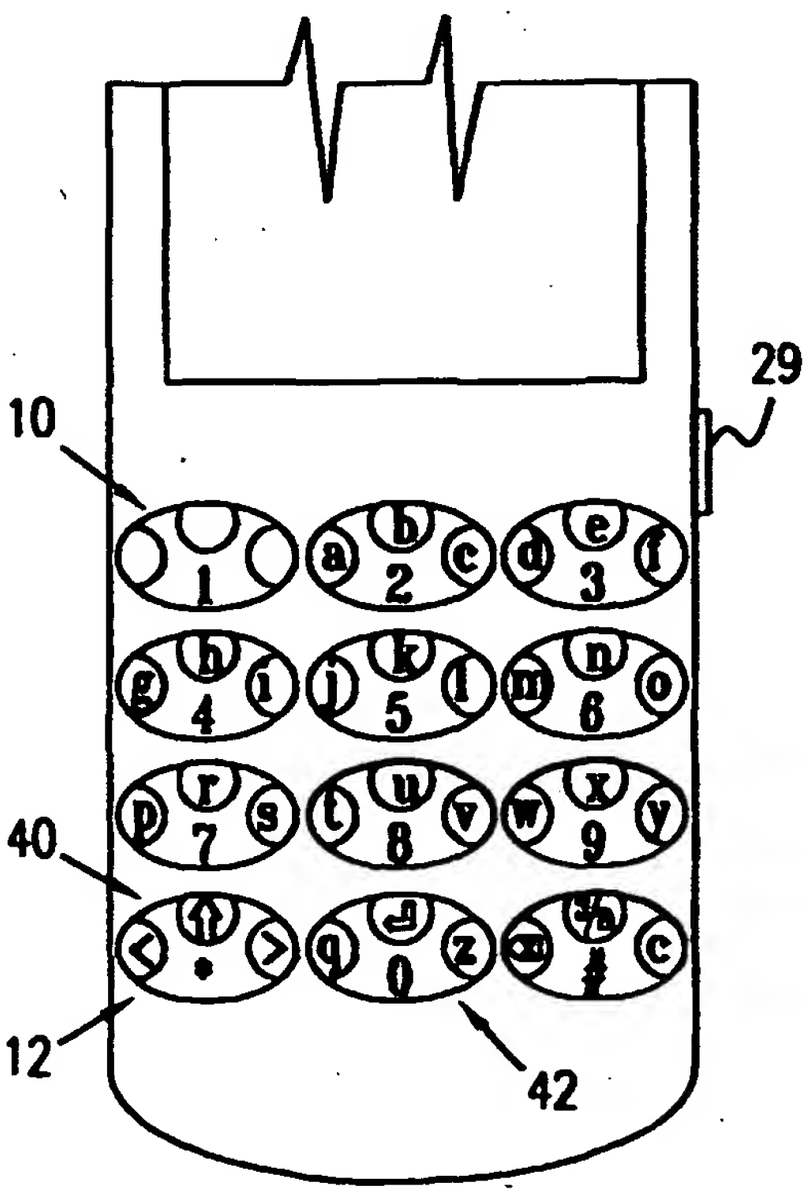
(54) Title: ALPHANUMERIC KEYPAD



(57) Abstract: An alphanumeric key including a key body (10) mounted on a keypad (12), the key body pivoting about a pivot (28) and having two modes of operation, a first mode wherein pressing the key body in any direction is associated with a single numeral, and a second mode wherein pressing the key body in a first direction about the pivot is associated with a first character, and pressing the key body in a second direction is associated with a second character different from the first character; and a switch (29) operatively connected to the key body operative to switch between the first and second modes of operation.

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ALPHANUMERIC KEYPAD

FIELD OF THE INVENTION

The present invention relates generally to alphanumeric keys for keypads or keyboards, and particularly to a novel key with multi-stroke positions, and to a novel icon language and help feature.

BACKGROUND OF THE INVENTION

The first generation of alphanumeric keys for keypads, keyboards and the like, includes keys that are dedicated to one and only one character. Striking such a key sends a message to display or print a single letter, numeral or symbol.

The next generation of alphanumeric keys includes multi-purpose keys that are associated with more one character. For example, multi-lingual keyboards have keys that can be used to display or print different characters in different languages and alphabets. The different characters or letters are generally printed on the keys. Switching between the two languages can be accomplished by hardware or software. Another well known example is that of keys for pocket calculators wherein the keys can have a second or third function, depending on whether a switching key has been stroked prior to striking the desired key. Many mobile phones have alphanumeric keys, which if pressed normally, are associated with a numeral. However, if the key is pressed rapidly one time after another, the key toggles from a numeral to letters, such as toggling from the numeral 2 to the letters A, B and C.

In many applications, such as mobile phones and laptop computers, striking the alphanumeric keys causes characters to be displayed on a display, typically an LCD display. As is well known, the display often shows a series of menus or prompts and a user is required to perform some operation associated with the menu or prompt. However, unfortunately many times it is unclear from the prompt itself what operation is requested of the user and what kind of outcome the operation will elicit. For example, the word "HOME" appearing on a display can prompt the user to return to a home page, or to return to the beginning of a line, page or document, or may simply be one of a list

of options in a table of words that includes, besides "home", the words "office", and "school". It is thus seen that the prompts of the current art often do not adequately convey their connotation.

Another problem with keyboards and displays is that when the user wishes to perform the operation associated with the menu or prompt, but does not fully understand what is required, on-line help for that particular operation is often lacking.

SUMMARY OF THE INVENTION

One object of the present invention is to provide a simple and inexpensive key that solves the abovementioned problems of the prior art. The key of the present invention is pivoted about a pivot, and has two modes of operation. Preferably a switch (hardware or software) is provided for switching between the modes of operation. In a first mode, pressing the key in any direction is associated with a single numeral. In a second mode, pressing the key in a first direction about the pivot is associated with a first character, and pressing the key in a second direction about the pivot is associated with a second character different from the first character.

The present invention also provides a novel functional display language. The functional display language preferably includes a plurality of genus symbols displayable on a display. Each genus symbol has a one-to-one correspondence with one family of functions. The language also preferably includes a plurality of species symbols that each represent a function. One species symbol is displayed near (e.g., above, below, to the left of, to the right of) one genus symbol. The family of functions may be any kind of function commonly used in computers, mobile phones and the like, such as causing a change in the display, or causing an action to be performed in a foreground or background of the display, for example. The term symbol, as used in the specification and claims, encompasses any letter, numeral, character, picture or icon, for example. The species symbol is preferably alphanumeric. Each combination of genus and species symbols connotes unique functional information.

The present invention also provides a novel method for acquiring on-line help prior to performing a command with a keystroke. A user can access a help data base by maintaining pressure on a key for longer than a predetermined period of time, for

example, 1-2 seconds. This prolonged time signals a CPU to display the required help drawn from the help data base. The help information which is displayed preferably includes information explaining the action that will occur if the key is pressed to perform the command.

It is noted that throughout the specification and claims the terms keypad and keyboard are used interchangeably.

There is thus provided in accordance with a preferred embodiment of the present invention an alphanumeric key including a key body mounted on a keypad, the key body pivoting about a pivot and having two modes of operation, a first mode wherein pressing the key body in any direction is associated with a single numeral, and a second mode wherein pressing the key body in a first direction about the pivot is associated with a first character, and pressing the key body in a second direction is associated with a second character different from the first character, and a switch operatively connected to the key body operative to switch between the first and second modes of operation. In accordance with a preferred embodiment of the present invention, the pivot has four edges.

In accordance with a preferred embodiment of the present invention there is also provided a touch pad that includes a support surface and a plurality of contact zones, each contact zone being associated with a different character or function, a protuberance extending from an underside of the key body and resting against the support surface, the key body pivoting about the protuberance, and a plurality of contact points spaced about the protuberance on the underside of the key body, wherein when the key body pivots about the protuberance, only one of the contact points abuts against only one of the contact zones.

Further in accordance with a preferred embodiment of the present invention at least one of the contact points protrudes from the underside of the key body.

Still further in accordance with a preferred embodiment of the present invention at least one of the contact points is generally flush with the underside of the key body.

Additionally in accordance with a preferred embodiment of the present invention at least one bump is formed on an upper surface of the key body opposite at least one of the contact points.

In accordance with a preferred embodiment of the present invention three contact points are spaced about and protrude from the protuberance on the underside of the key body, and a fourth contact point is generally flush with the underside of the key body, and wherein three bumps are formed on an upper surface of the key body opposite each of the three contact points, each of the three bumps and their corresponding three contact points being associated with three different characters, and the fourth contact point being associated with a fourth character different from the three other characters. In one example the three different characters are letters and the fourth character is a numeral. In another example, the three different characters are symbols and the fourth character is another symbol. In yet another example, one of the three different characters is a symbol, the other two of the three different characters are letters, and the fourth character is a numeral. The symbols erase a letter, jump to next line

Further in accordance with a preferred embodiment of the present invention the protuberance is also a contact point.

There is also provided in accordance with a preferred embodiment of the present invention a functional display language, including a plurality of genus symbols displayable on a display, each genus symbol having a one-to-one correspondence with one family of functions, and a plurality of species symbols that each represent a function, one of the species symbols being displayable near one of the genus symbol on the display, wherein a combination of a first species symbol with a first genus symbol connotes a first type of functional information, and a combination of a second species symbol with the first genus symbol connotes a second type of functional information that is different from the first type of functional information.

In accordance with a preferred embodiment of the present invention the family of functions can cause a change in a display, an action to be performed in a foreground or background of a display, or a change from one display page to another, for example. The species symbol is preferably alphanumeric.

There is also provided in accordance with a preferred embodiment of the present invention a method for acquiring on-line help prior to performing a command with a keystroke, including providing a command that is to be performed by means of striking a key on a keyboard, providing a help data base that includes help information on

keystroke-activated commands including the command, the data base being accessible by maintaining pressure on the key for longer than a predetermined period of time, and pressing down on the key and maintaining pressure on the key for longer than the predetermined period of time, thereby acquiring on-line help.

In accordance with a preferred embodiment of the present invention the help information includes information explaining the action that will occur if the key is pressed (short press) to perform the command.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more fully from the following detailed description, taken in conjunction with the drawings in which:

Figs. 1A, 1B, 1C and 1D are simplified top-view, side-view sectional, front-view sectional and bottom-view illustrations, respectively, of an alphanumeric key body constructed and operative in accordance with a preferred embodiment of the present invention, Figs. 1B and 1C being taken along lines 1B-1B and 1C-1C, respectively, in Fig. 1A;

Fig. 2 is a simplified pictorial illustration of an alphanumeric keypad with key bodies of Figs. 1A-1D installed thereon, constructed and operative in accordance with a preferred embodiment of the present invention;

Fig. 3A is a simplified pictorial illustration of an empty shell that can be used to house the components of the alphanumeric keypad of Fig. 2;

Figs. 3B and 3C are simplified pictorial illustrations of different layers of the alphanumeric keypad of Fig. 2;

Fig. 4 is a simplified illustration of a functional display language, constructed and operative in accordance with a preferred embodiment of the present invention;

Fig. 5 is a simplified illustration of a prior art mobile phone that uses prior art symbols in a display;

Figs. 6A, 6B, 6C and 6D are simplified illustrations of a mobile phone display that uses the functional display language of Fig. 4, constructed and operative in accordance with a preferred embodiment of the present invention; and

Figs. 7A-7D are simplified illustrations of a method for acquiring on-line help prior to performing a command with a keystroke, in accordance with a preferred embodiment of the present invention, wherein in Fig. 7A, a user wishes to perform an action by striking a key on a keyboard, in Fig. 7B, the user can access a help data base by maintaining pressure on the key for longer than a predetermined period of time, in Fig. 7C, the user can additionally access a general help menu from the help data base, and in Fig. 7D, the user has pressed the key to perform the desired action.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Reference is now made to Figs. 1A-1D, 2 and 3A-3C which illustrate a novel key body 10 (Figs. 1A-1D) used with an alphanumeric keypad 12 (Fig. 2), constructed and operative in accordance with a preferred embodiment of the present invention.

Alphanumeric keypad 12 preferably includes a touch pad 14 that includes a support surface 16 and a plurality of contact zones 18. As described hereinbelow, when keypad 12 and key body 10 are operated in a first mode of operation, all of the contact zones 18 are associated with the same character, i.e., letter, numeral or symbol. When keypad 12 and key body 10 are operated in a second mode of operation, each contact zone 18 is preferably associated with a different character, such as a different letter, numeral or symbol. Touch pad 14 can be constructed in a variety of manners, such as that shown in Fig. 3B, wherein the contact zones 18 comprise copper electric contacts 20 that can be in electrical contact with a printed circuit board (not shown). Additionally or alternatively, as shown in Fig. 3C, touch pad 14 can comprise an elastomeric membrane 22 with electrical contacts 24. Keypad 12 may be housed in a shell 26. It is to be emphasized that the present invention is not limited to the above described touch pads, and touch pad 14 can be constructed in many other variations as well.

Key body 10 preferably has a protuberance 28 that extends from an underside 30 thereof. Protuberance 28 preferably rests against support surface 16, and key body 10 pivots about protuberance 28. A plurality of contact points 32 are preferably spaced about protuberance 28 on the underside 30 of key body 10. When key body 10 pivots about protuberance 28, only one of contact points 32 abuts against only one of contact zones 18. The point of contact of protuberance 28 with support surface 16 is thus a

pivot. In accordance with a preferred embodiment of the present invention, protuberance 28 has four edges and is generally rectangular or square. This structure ensures that when it is desired to tilt key body 10 to the right, for example, the key body will indeed *only* tilt to the right and not to the upper right or downward right.

In accordance with a preferred embodiment of the present invention, a switch 29 is provided that switches between first and second modes of operation of the key body 10. Switch 29 may switch either by means of hardware or software or both. In a first mode, the pressing of key body 10 in any direction, whether pivoted about protuberance 28 or straight down, for example, is associated with a single numeral. In a second mode, the pressing of key body 10 in a first direction about the pivot is associated with a first character, whereas the pressing of key body 10 in a second direction, whether about the pivot or straight down, for example, is associated with a second character different from the first character.

In the illustrated embodiment, three contact points 32 are spaced about and protrude from protuberance 28 on the underside 30 of key body 10. A fourth contact point 32' (Fig. 1D) is generally flush with the underside 30 of key body 10. Three bumps 34 are preferably formed on an upper surface 36 of key body 10 opposite each of the three contact points 32. In the first mode of operation, all of the contact points 32 and 32' are associated with the same numeral (in this example, the numeral 6). In the second mode of operation, each of the three bumps 34 and their corresponding three contact points 32 are preferably associated with three different characters, and the fourth contact point 32' is preferably associated with a fourth character different from the three other characters. For example, as seen in Fig. 1A, the three different characters are the letters m, n and o, and the fourth character is the numeral 6. Other examples may be seen in Fig. 2. In one key body 40, three different characters are symbols (arrow, <, >) and the fourth character is another symbol (*). In another key body 42, one of the three different characters is a symbol (return sign), the other two of the three different characters are letters (q, z), and the fourth character is a numeral (0). It is appreciated that many other examples are possible within the scope of the invention.

In accordance with a preferred embodiment of the present invention, the protuberance 28 can also be a contact point, wherein the key body is not tilted to strike the character, but rather pushed generally straight down.

Reference is now made to Fig. 4 which illustrates a functional display language, constructed and operative in accordance with a preferred embodiment of the present invention.

The functional display language preferably includes a plurality of genus symbols 50 displayable on a display 52 (Figs. 6A-6D. Each genus symbol has a one-to-one correspondence with one family of functions, as will be described further in detail hereinbelow. The language also preferably includes a plurality of species symbols 54 that each represent a function. One species symbol 54 is displayed near (e.g., above, below, to the left of, to the right of) one genus symbol 50. The family of functions may be any kind of function commonly used in computers, mobile phones and the like, such as causing a change in display 52, or causing an action to be performed in a foreground or background of display 52, for example. The species symbol is preferably alphanumeric.

The following are some examples of genus symbols and species symbols of the functional display language:

PAGE (the genus symbol may be an icon of a page) - Changes from one display page to another. The species symbol 54 of the PAGE is the type of page, e.g., phone-book, home, end, top, etc.

BACK (the genus symbol may be an icon of a upward pointing arrow) - If all of the displayed information cannot fit onto the display at one time, this function causes display of the information before or above the current display. This icon does not necessarily require a species symbol 54.

NEXT (the genus symbol may be an icon of a downward pointing arrow) - If all of the displayed information cannot fit onto the display at one time, this function causes display of the information after or below the current display. This icon does not necessarily require a species symbol 54.

COMMAND (the genus symbol may be an icon of a geometric shape, such as a triangle) - Performs an operation that does not necessarily require a change in the display. The

species symbol 54 that appears together with the COMMAND icon, represents the action that will be performed by carrying out the command. After performing the operation, COMMAND can either remain unchanged on the display screen or can change to another icon.

CYCLIC (the genus symbol may be an icon of a double arrow) - Proceeds through a list of functions one-by-one, wherein the name or symbol of each of the items or functions in the list (i.e., the species symbol 54) appears next to the CYCLIC icon. The CYCLIC icon remains on the display screen, but the symbols of the items or functions in the list change as the user searches through the list.

CHECK (the genus symbol may be an icon of a check sign) - This is an on/off toggle switch that alternatively activates or deactivates the species symbol 54 that appears together with the CHECK icon. CHECK thus permits or prevents performing the operation of species symbol 54.

DATA (the genus symbol may be an icon of a rightward pointing arrow) - This icon appears next to a data-entry field. When the DATA command is chosen, the display transforms into a state ready for accepting an input of data.

DATA ENTRY (the genus symbol may be an icon of a finger, for example) - After the display is ready for data input, this icon appears and signals that data should now be input.

It is to be emphasized that these are just some examples of the many possibilities of genus symbols that can be used in the functional display language of the invention. Preferably a relatively small number of symbols are used to facilitate remembering and using the symbols.

A good example that shows the contrast between the functional display language of the present invention and the displays of the prior art, may be seen by comparing Fig. 5, which is a simplified illustration of a prior art mobile phone that uses prior art symbols in a display, with Figs. 6A-6D, which illustrate mobile phone display 52 that uses the functional display language of the present invention. In the prior art, the word HOME appears on display 52, but its intention is not clear at all. In contrast, in Fig. 6A, the CHECK icon appears next to HOME (the CHECK icon being the genus symbol and HOME being the species symbol). It is now clear that the intention is to check HOME

as a selection in some program or application. In Fig. 6B, the DATA icon appears next to HOME, meaning that a name or other entry will be entered at HOME. In Fig. 6C, the CYCLIC icon appears next to HOME, meaning that the user can proceed through a list of items, one of them being HOME, others possibly being SCHOOL, OFFICE, etc. In Fig. 6D, the PAGE icon appears next to HOME, meaning that the user is being directed to the home page.

In summary, each combination of genus and species symbols connotes unique functional information. In other words, a combination of a first species symbol with a first genus symbol connotes a first type of functional information, and a combination of a second species symbol with the first genus symbol connotes a second type of functional information that is different from the first type of functional information.

Reference is now made to Figs. 7A-7D which illustrate a method for acquiring on-line help prior to performing a command with a keystroke. In Fig. 7A, a user wishes to perform an action by striking a key on a keyboard. For example, display 52 in Fig. 7A shows the PAGE icon with HOME (described hereinabove with reference to Fig. 6D). The user wishes to strike a key 58 to perform an action associated with this display. A help data base 60 is provided (also shown in Fig. 6D) that includes help information on keystroke-activated commands including the particular command of interest. The help data base 60 is preferably in communication with a CPU 62. As seen in Fig. 7B, the user can access the help data base 60 by maintaining pressure on the key for longer than a predetermined period of time, for example, 1-2 seconds. This prolonged time signals the CPU 62 to display the required help drawn from help data base 60. The help information which is displayed preferably includes information explaining the action that will occur if the key is pressed to perform the command. As seen in Fig. 7C, the user can additionally access a general help menu 64 from help data base 60, if desired, by pressing another predetermined key 59, or by waiting another predetermined delay time. In Fig. 7D, the user has pressed the key to perform the desired action.

It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the present invention includes both combinations and subcombinations of the features described hereinabove as well as modifications and variations thereof which

would occur to a person of skill in the art upon reading the foregoing description and which are not in the prior art.

CLAIMS

What is claimed is:

1. An alphanumeric key comprising:

a key body mounted on a keypad, said key body pivoting about a pivot and having two modes of operation, a first mode wherein pressing the key body in any direction is associated with a single numeral, and a second mode wherein pressing the key body in a first direction about the pivot is associated with a first character, and pressing the key body in a second direction is associated with a second character different from said first character; and

a switch operatively connected to said key body operative to switch between the first and second modes of operation.

2. The key according to claim 1 wherein said pivot has four edges.

3. The key according to claim 1 and further comprising:

a touch pad that includes a support surface and a plurality of contact zones, each contact zone being associated with a different character;

a protuberance extending from an underside of said key body and resting against said support surface, said key body pivoting about said protuberance; and

a plurality of contact points spaced about said protuberance on the underside of said key body, wherein when said key body pivots about said protuberance, only one of said contact points abuts against only one of said contact zones.

4. The key according to claim 3 wherein at least one of said contact points protrudes from the underside of said key body.

5. The key according to claim 3 wherein at least one of said contact points is generally flush with the underside of said key body.

6. The key according to any of the preceding claims wherein at least one bump is formed on an upper surface of said key body opposite at least one of said contact points.

7. The key according to claim 3 wherein three contact points are spaced about and protrude from said protuberance on the underside of said key body, and a fourth contact point is generally flush with the underside of said key body, and wherein three bumps are formed on an upper surface of said key body opposite each of the three contact points, each of the three bumps and their corresponding three contact points being

associated with three different characters, and the fourth contact point being associated with a fourth character different from the three other characters.

8. The key according to claim 7 wherein said three different characters are letters and the fourth character is a numeral.

9. The key according to claim 7 wherein said three different characters are symbols and the fourth character is another symbol.

10. The key according to claim 7 wherein one of said three different characters is a symbol, the other two of said three different characters are letters, and the fourth character is a numeral.

11. The key according to any of the preceding claims wherein said protuberance is also a contact point.

12. A functional display language, comprising:

a plurality of genus symbols displayable on a display, each genus symbol having a one-to-one correspondence with one family of functions; and

a plurality of species symbols that each represent a function, one of said species symbols being displayable near one of said genus symbol on said display, wherein a combination of a first species symbol with a first genus symbol connotes a first type of functional information, and a combination of a second species symbol with the first genus symbol connotes a second type of functional information that is different from the first type of functional information.

13. The functional display language according to claim 12 wherein said family of functions causes a change in a display.

14. The functional display language according to claim 12 wherein said family of functions causes an action to be performed in a foreground of a display.

15. The functional display language according to claim 12 wherein said family of functions causes an action to be performed in a background of a display.

16. The functional display language according to claim 12 wherein said family of functions causes a change from one display page to another.

17. The functional display language according to claim 16 wherein the genus symbol corresponding to said family is an icon of a page.

18. The functional display language according to claim 12 wherein said family of functions causes display of information that appears prior to a current display.

19. The functional display language according to claim 18 wherein the genus symbol corresponding to said family is an icon of a downward pointing arrow.

20. The functional display language according to claim 12 wherein said family of functions causes display of information that appears subsequent to a current display.

21. The functional display language according to claim 20 wherein the genus symbol corresponding to said family is an icon of a upward pointing arrow.

22. The functional display language according to claim 12 wherein said family of functions causes performance of an operation that does not necessarily require a change in a display, and wherein the species symbol next to the genus symbol of said family of functions represents an action that will be performed by carrying out the operation.

23. The functional display language according to claim 22 wherein the genus symbol corresponding to said family is an icon of a geometric shape.

24. The functional display language according to claim 12 wherein said family of functions causes one-by-one movement through a list of functions.

25. The functional display language according to claim 24 wherein the genus symbol corresponding to said family is an icon of a double arrow.

26. The functional display language according to claim 12 wherein said family of functions is an on/off toggle switch that alternatively activates or deactivates the species symbol that appears next to said genus symbol.

27. The functional display language according to claim 26 wherein the genus symbol corresponding to said family is an icon of a check sign.

28. The functional display language according to claim 12 wherein said family of functions transforms a display into a state ready for accepting an input of data.

29. The functional display language according to claim 28 wherein the genus symbol corresponding to said family is an icon of a rightward pointing arrow.

30. The functional display language according to claim 12 wherein said family of functions signals that data should now be input.

31. The functional display language according to claim 30 wherein the genus symbol corresponding to said family is an icon of a finger.

32. The functional display language according to any of claims 12-31 wherein the species symbol is alphanumeric.

33. A method for acquiring on-line help prior to performing a command with a keystroke, comprising:

providing a command that is to be performed by means of striking a key on a keyboard;

providing a help data base that includes help information on keystroke-activated commands including said command, said data base being accessible by maintaining pressure on said key for longer than a predetermined period of time; and

pressing down on said key and maintaining pressure on said key for longer than the predetermined period of time, thereby acquiring on-line help.

34. The method according to claim 33 wherein said help information includes information explaining the action that will occur if the key is pressed to perform the command.

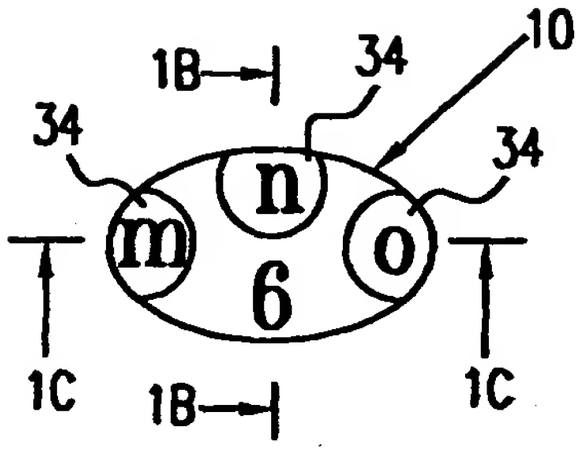


FIG. 1A

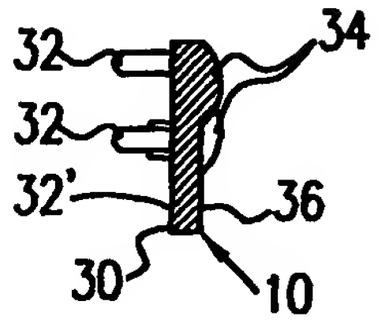


FIG. 1B

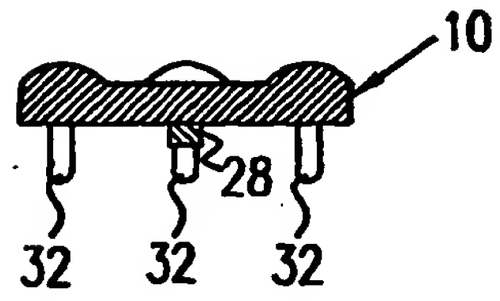


FIG. 1C

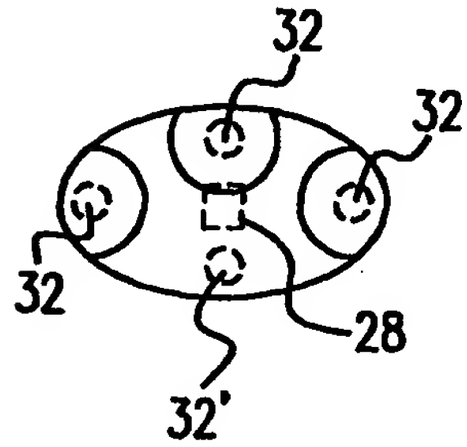


FIG. 1D

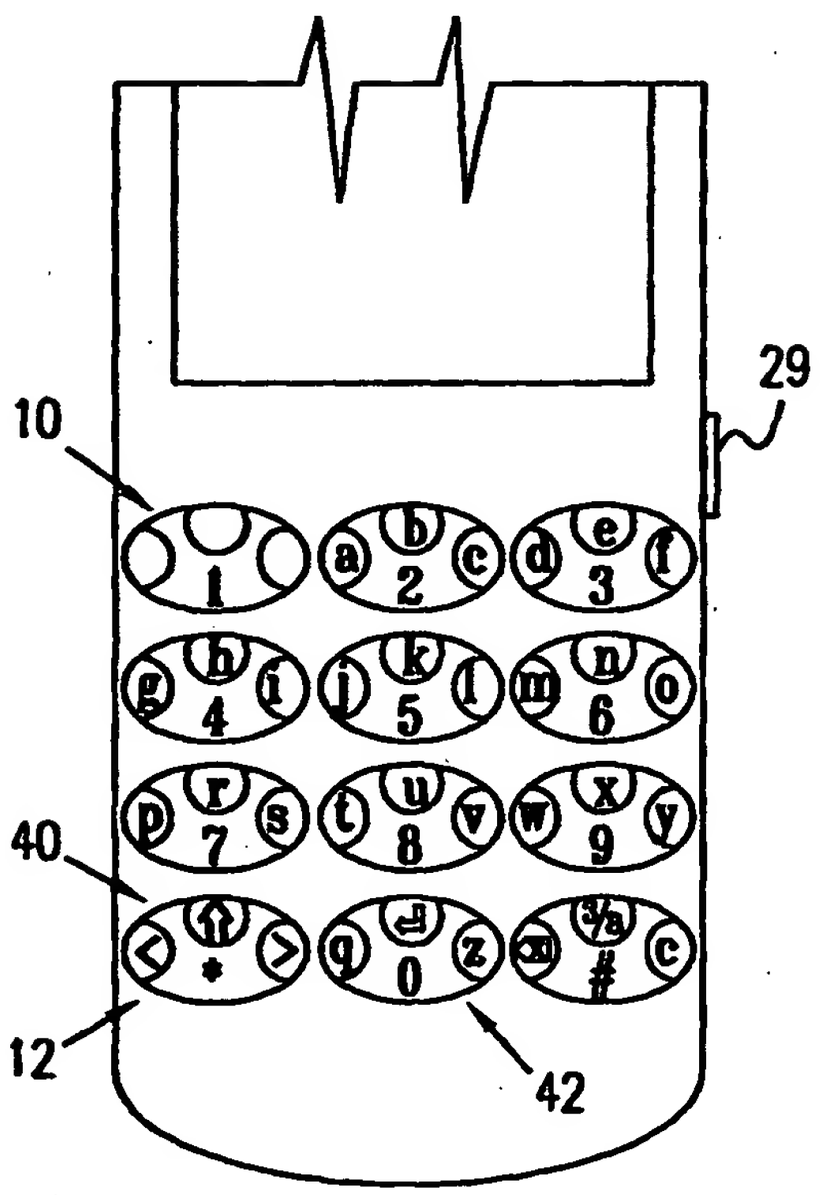


FIG. 2

FIG. 3C

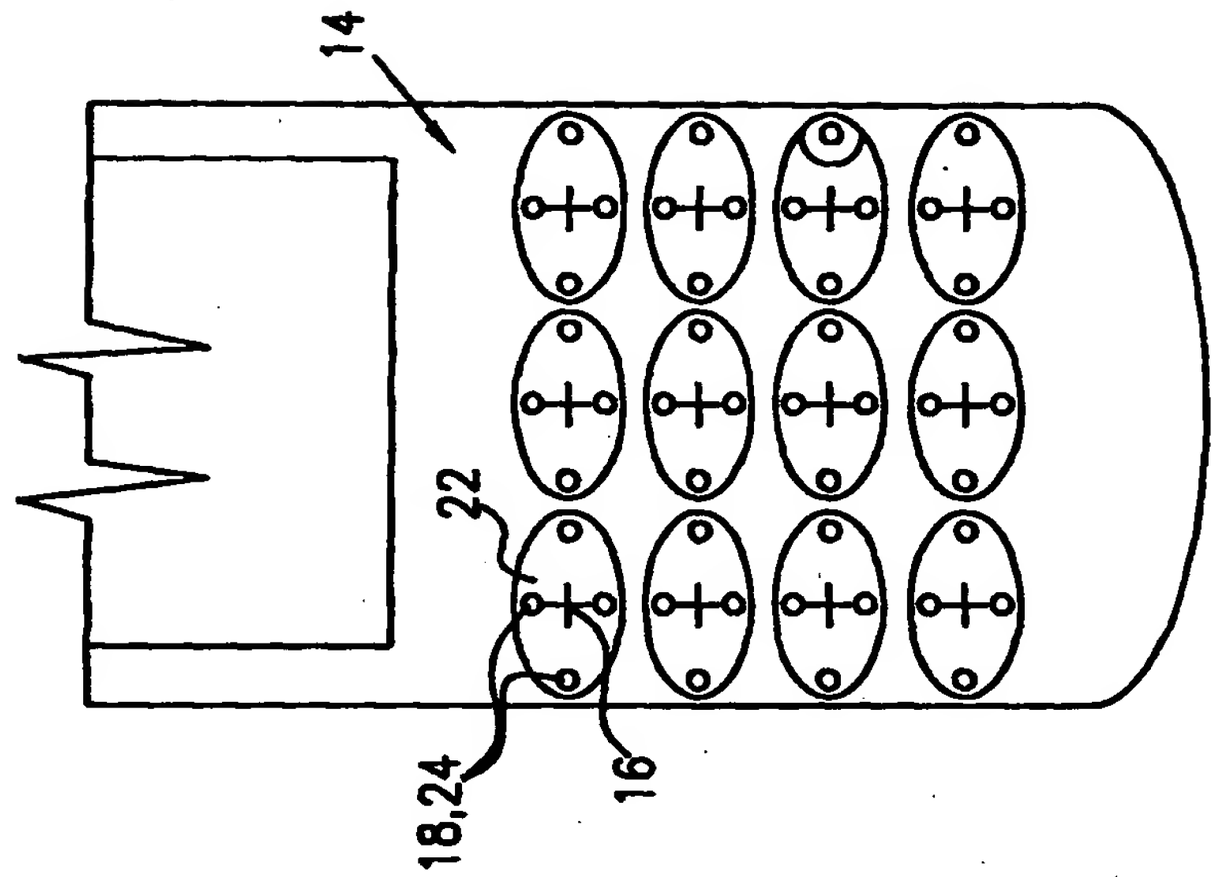


FIG. 3B

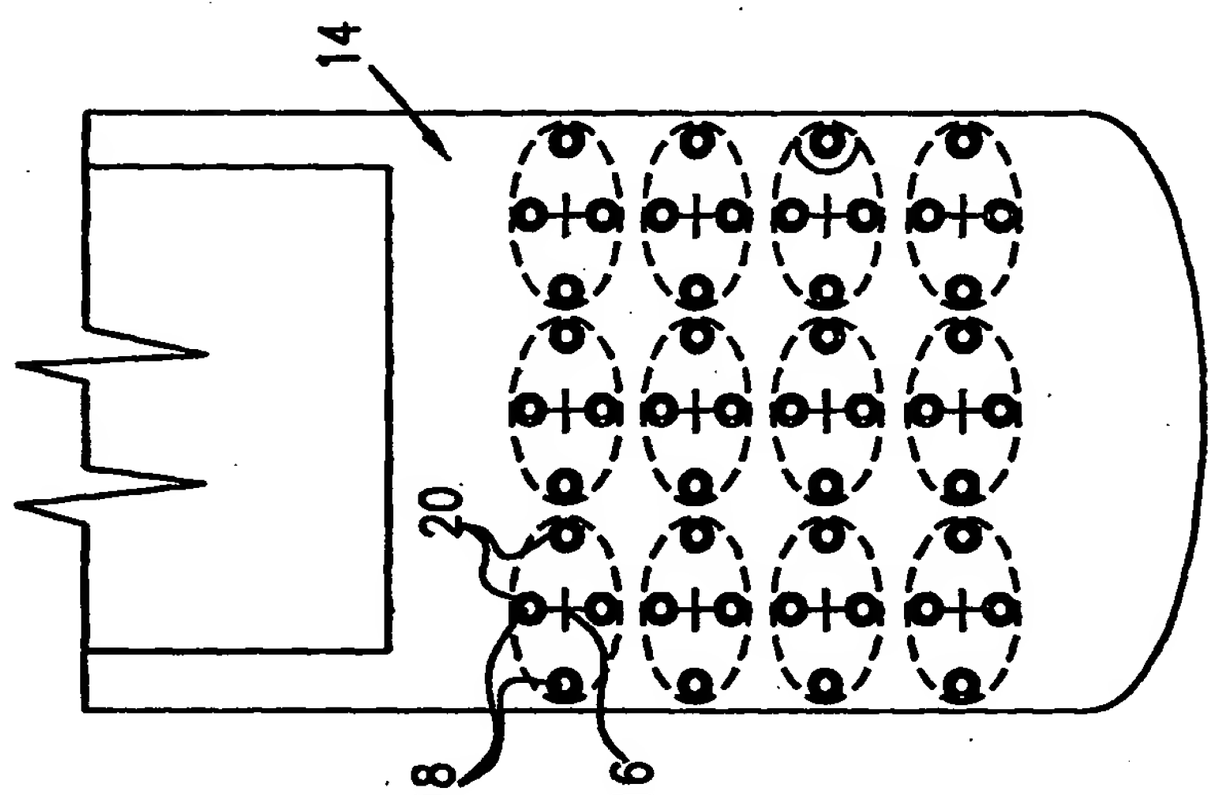


FIG. 3A

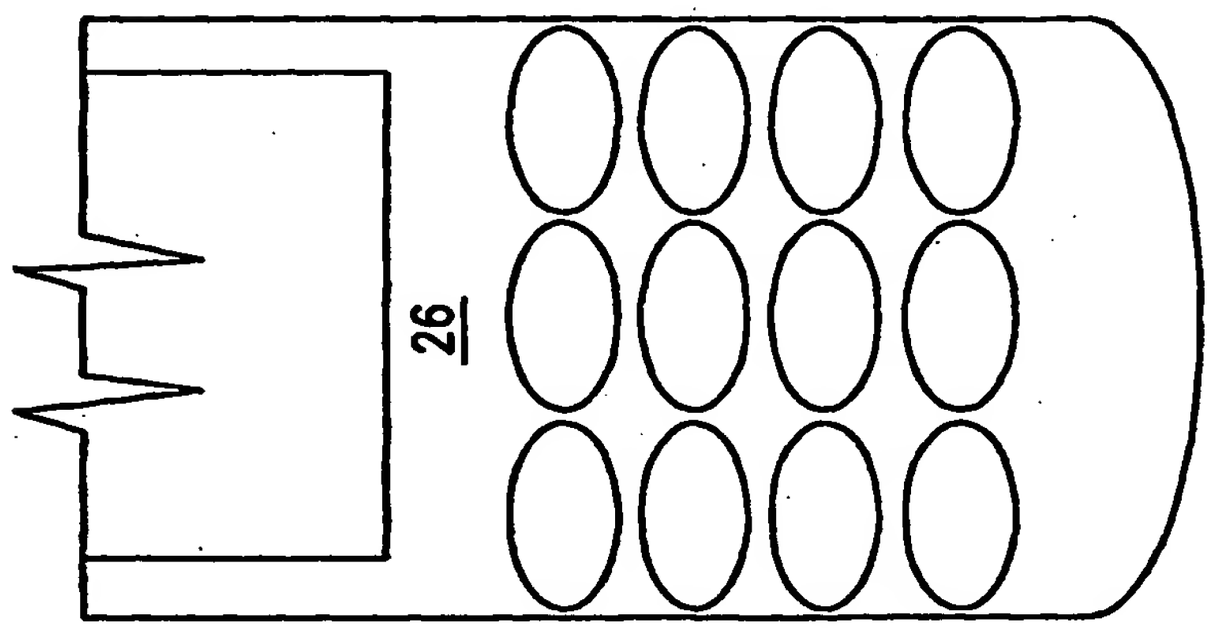
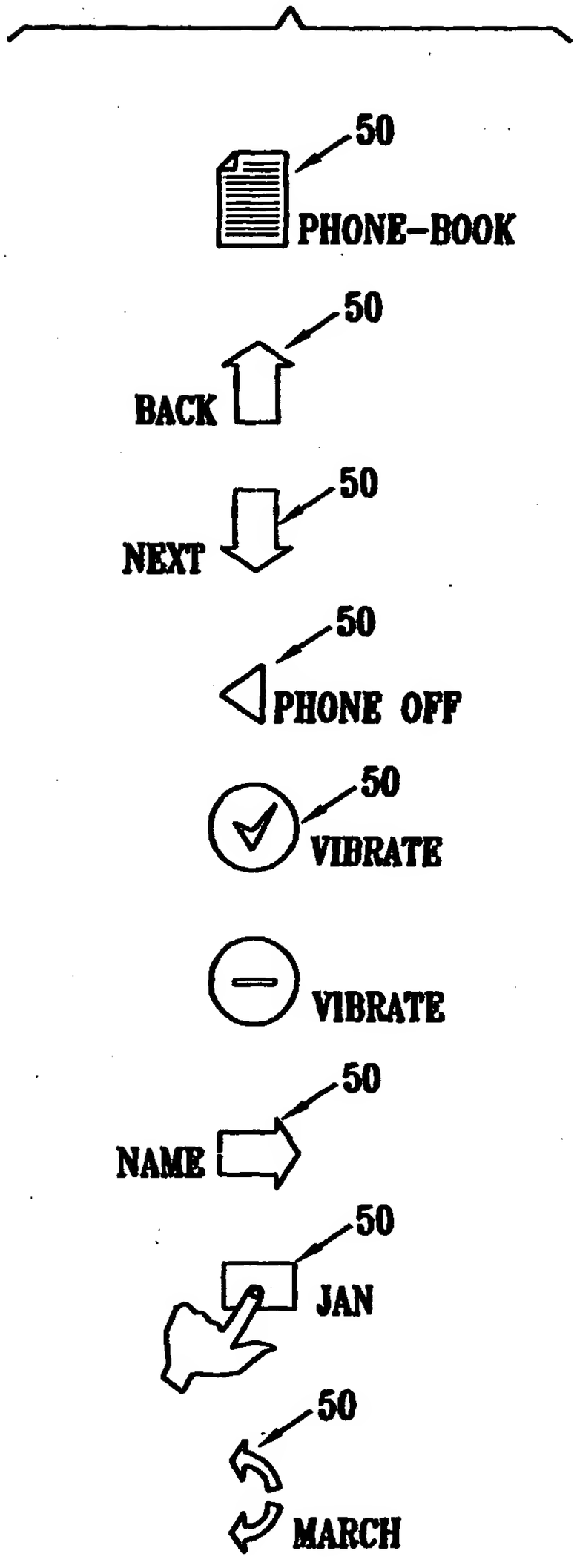


FIG. 4


50
PHONE-BOOK
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BACK
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VIBRATE
VIBRATE
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MARCH

FIG. 5
PRIOR ART

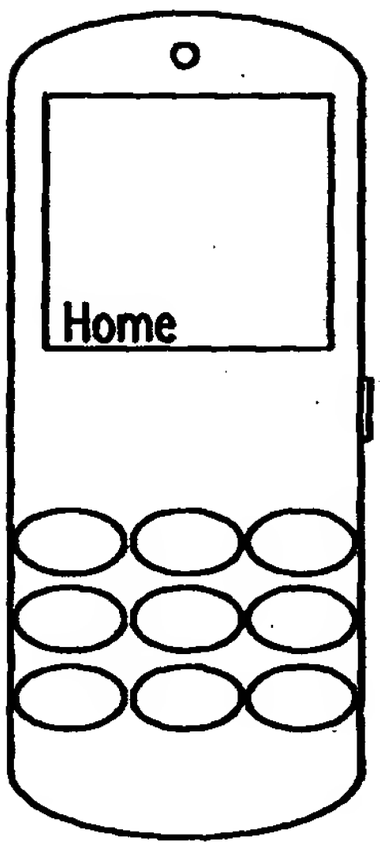


FIG. 6A

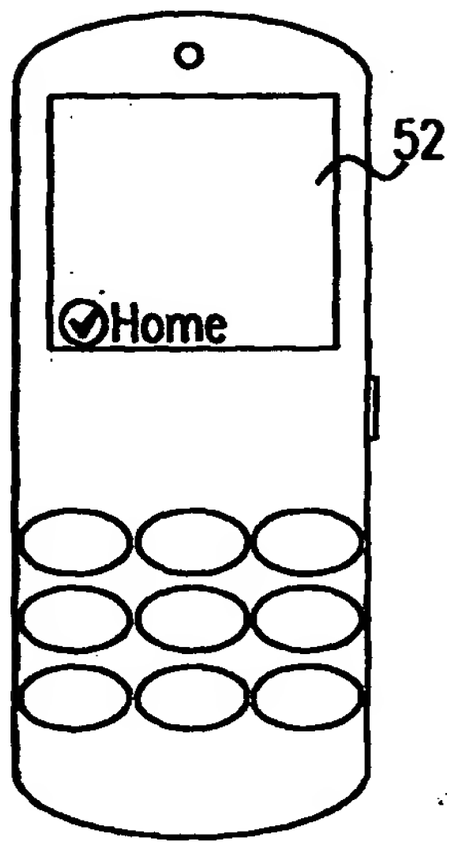


FIG. 6B

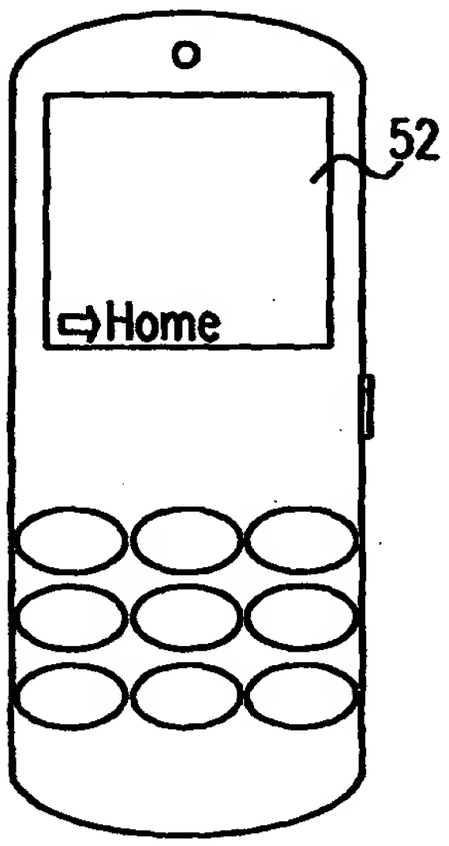


FIG. 6C

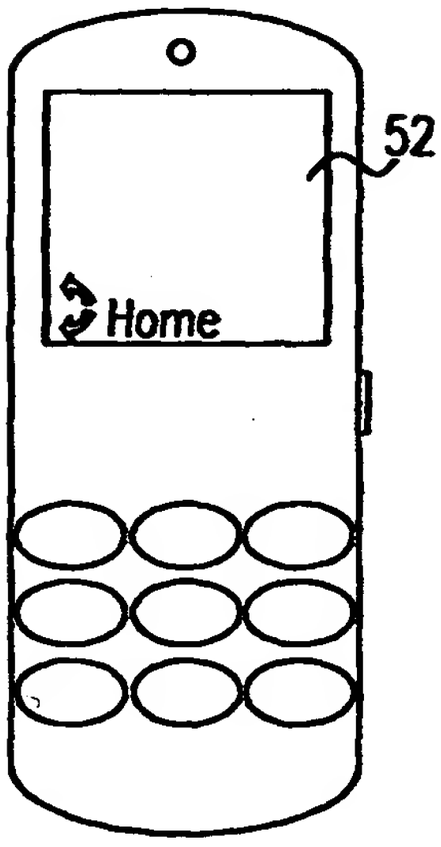


FIG. 6D

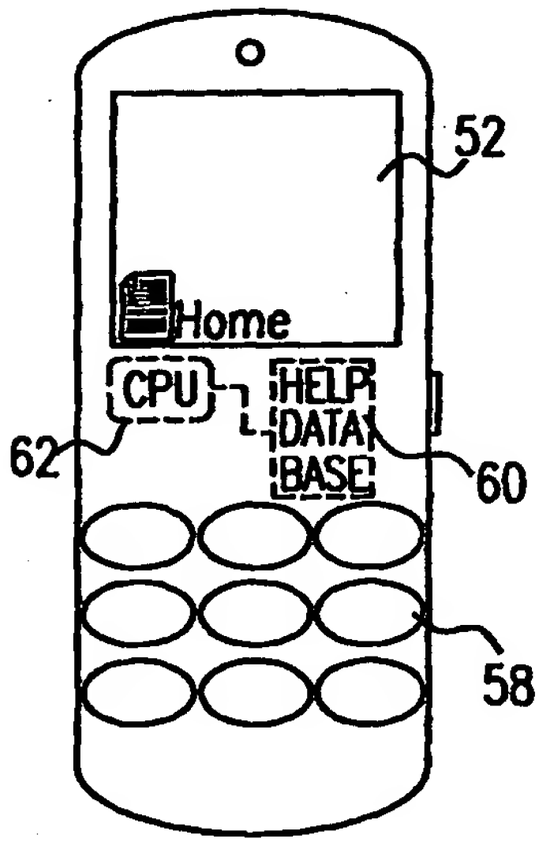
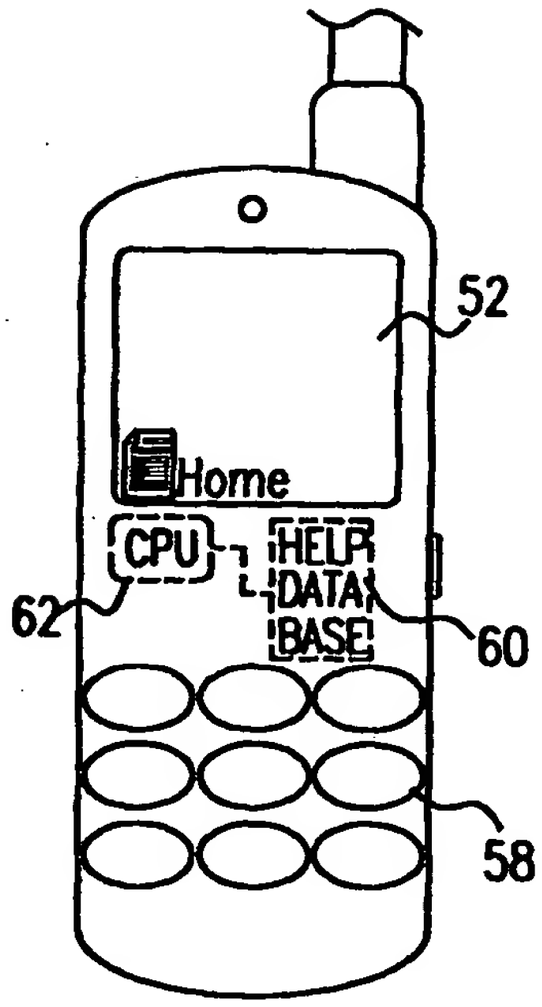


FIG. 7A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Home
CPU
HELP DATA BASE
62
60
58

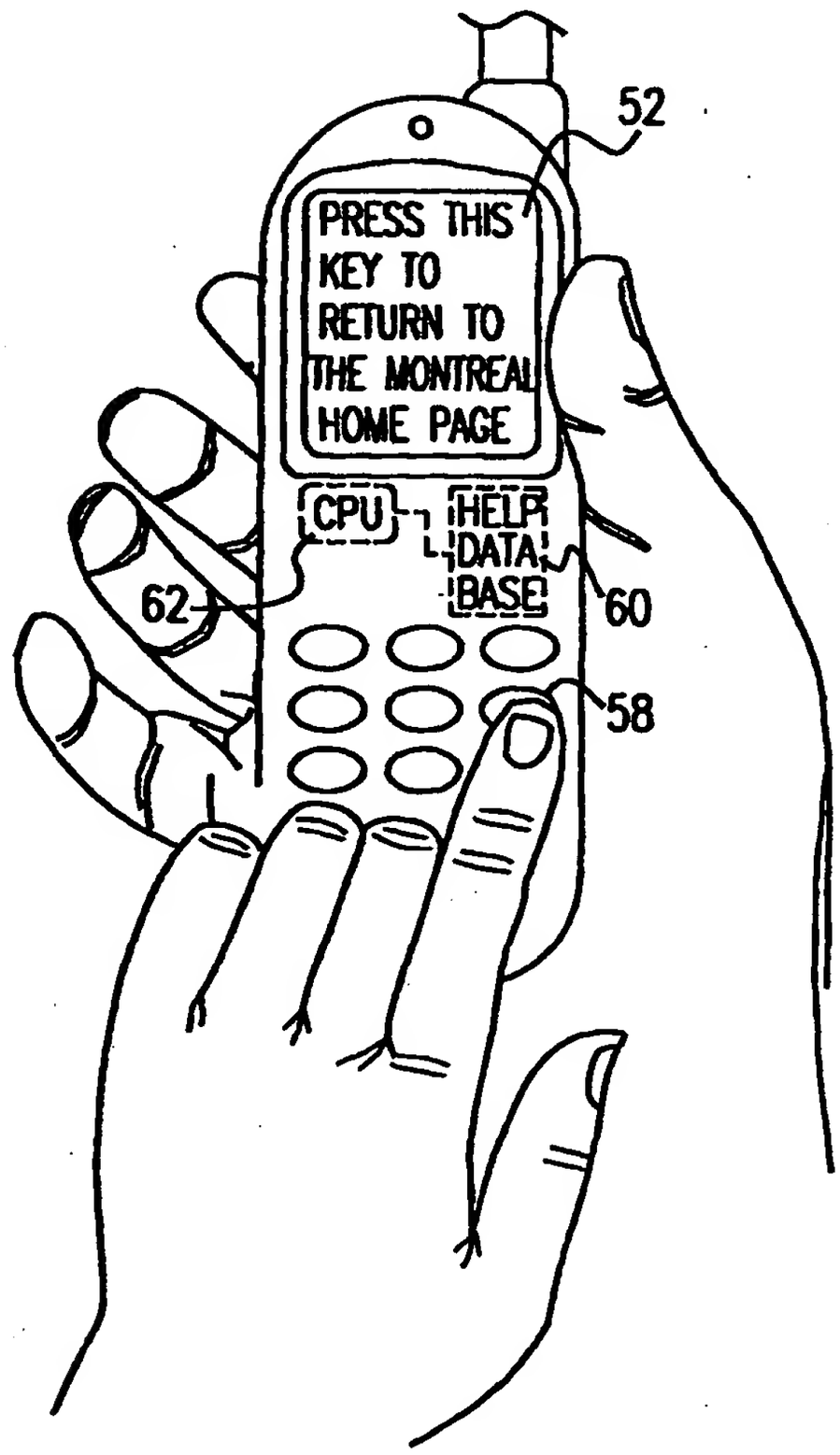
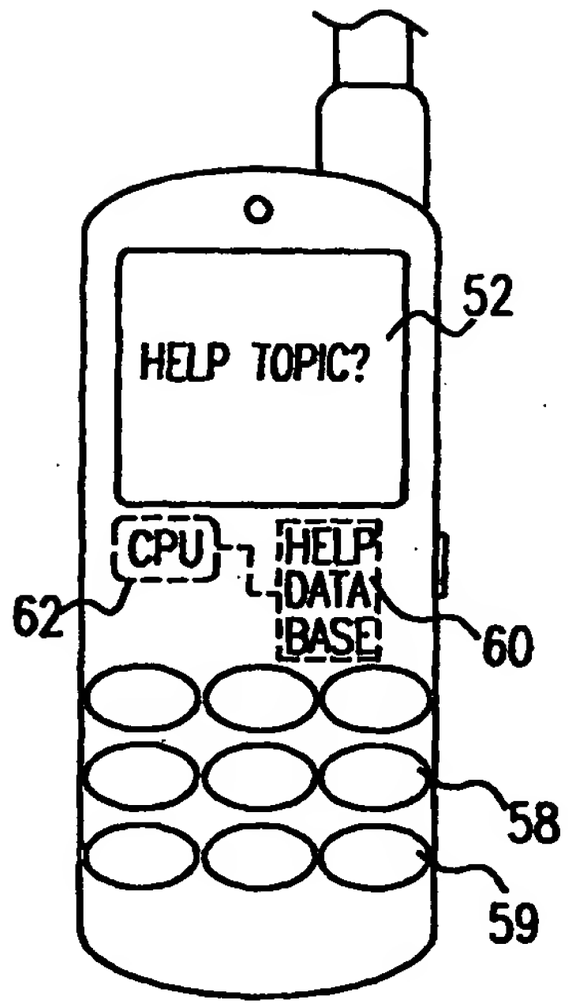

52
PRESS THIS KEY TO RETURN TO THE MONTREAL HOME PAGE
CPU
HELP DATA BASE
62
60
58

FIG. 7B

FIG. 7C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HELP DATA BASE
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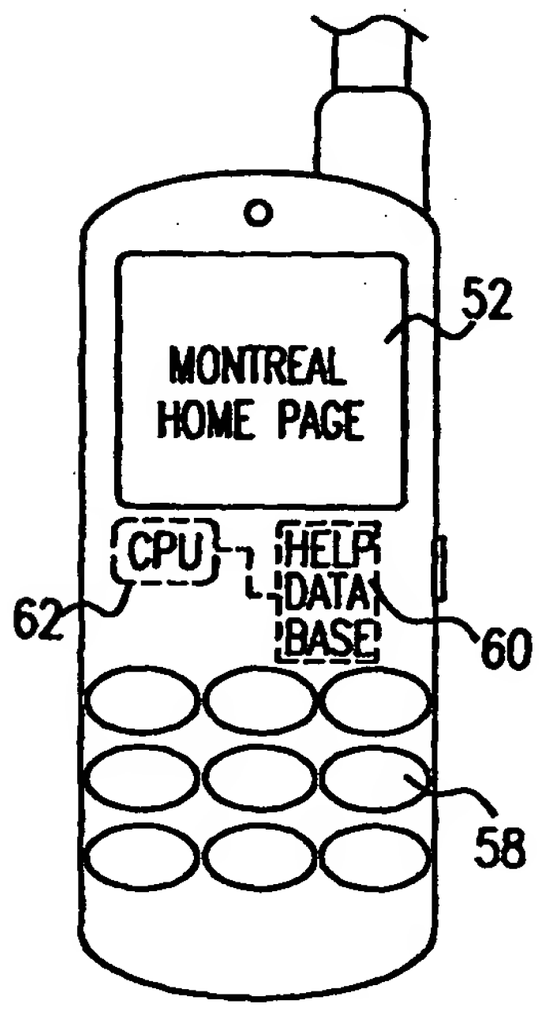
FIG. 7D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CPU
HELP DATA BASE
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60
58

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL01/00167

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :H01H 13/70, 25/00, 3/00; G06F 3/02
US CL :200/5A, 5R, 6A; 341/22; 345/2

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 200/5A, 5R, 6A; 341/22; 345/2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 5,861,823 A (STRAUCH et al) 19 January 1999 (19.01.1999), the entire document.	1 ——— 2-10
Y	US 5,528,235 A (LIN et al) 18 June 1996 (18.06.1996), the entire document.	2-10
Y	US 4,029,915 A (OJIMA) 14 June 1977 (14.06.1977), the entire document.	2-6, 9
Y	US 5,508,479 A (SCHOOLEY) 16 April 1996 (16.04.1996), the entire document.	3, 4
Y	US 4,896,003 A (HSIEH) 23 January 1990 (23.01.1990), the entire document.	3, 4

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 JULY 2001	05 SEP 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer MINH CHAU Telephone No. (703) 308-0956

Form PCT/ISA/210 (second sheet) (July 1998)★

INTERNATIONAL SEARCH REPORT

Internati[illegible]pplication No.
PCT/IL01/00167

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☒ Claims Nos.: 11
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-11

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Internati..... application No.
PCT/IL01/00167

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING
This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claims 1-11, drawn to an alphanumeric key classified in class 400 subclass 473.
Group II, claims 12-32, drawn to a functional display language classified in class 400 subclass 477.
Group III, claims 33-34, drawn to a method for acquiring on line help classified in class 101 subclass 484.

The claims of theses three groups are directed to different inventions which are not linked to form a single general concept. The claims in the different groups do not have in common the same or corresponding "special technical features". In particular the key body of Group I is completely different from the display language of Group II and neither can be used to operate the data base of Group III.